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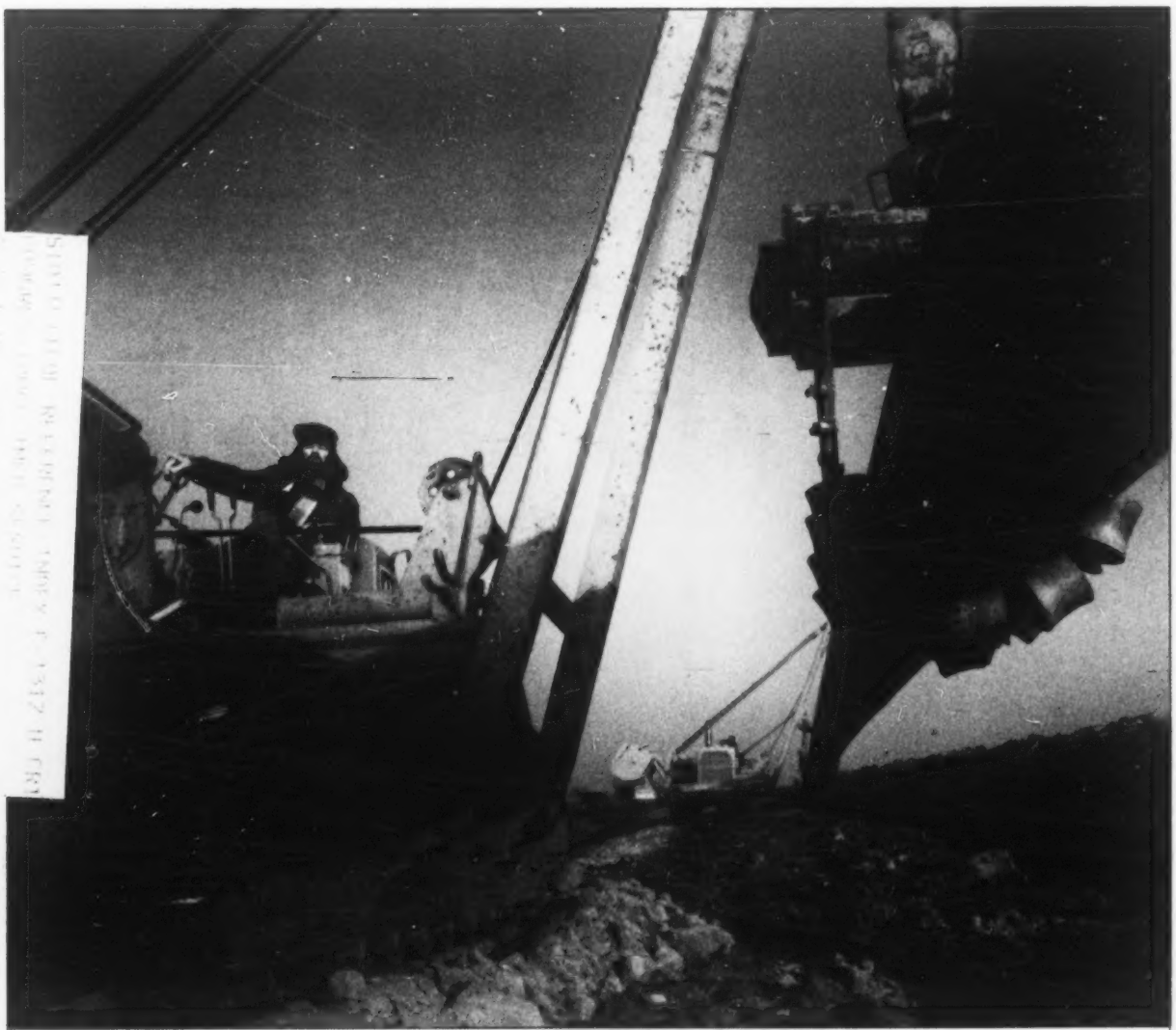

International Pipeline Report

• IPLOCA Convention Preview • International Forecast
• Equipment Focus: Trailers • STEGAL, MIDAL Update
• Altamont On Hold • Major Malaysian Projects

Pipeline & Utilities Construction

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On the cover:

This equipment operator for Mannesmann is bundled up against the spring cold as he helps lower pipe into the new German STEGAL system. See story page 30. (photograph by Mannesmannrohren-Werke AG)

International Pipeline Forecast

Healthy Growth Predicted In 1993 For International Market

By Oliver Klinger Jr.

International pipeline construction has entered a fast-growing period, accelerated by the new democracies in eastern Europe and by increasing demands for oil, gas and petroleum products in many parts of the world. Europe, the Middle East and Far East have many projects that will be constructed in the next few years.

Pipeline & Utilities Construction's projection is for 32,341 miles of new gas, products and crude oil pipelines in the 1992-93 period to cost in excess of $30 billion. Natural gas lines will comprise most of the pipeline expansion work, with 22,855 miles scheduled at a cost of roughly $26.3 billion. Products pipelines planned total 5,847 miles to cost $2,788,000, while a conservative estimate for crude oil lines projects 1,859 miles to cost $995 million.

Future pipelines, which may develop in the mid or late 90s, now total 13,781 miles to cost an estimated $10,940,000. These figures appear certain to expand substantially in coming years.

Among major gas pipelines to be constructed are the SNAMENEL Trans-Med line expansion from Algeria to Italy to cost several billion dollars and Statoil's Zeepipe system of 681 miles from the North Sea to landfall in Germany, costing $750 million. Germany's Midal line runs 398 miles at a cost of $583 million and Ruhrgas and other German gas companies have substantial expansion programs.

South America will see a boom in gas line construction with many new major lines to be constructed in Argentina, Bolivia, Brazil and Colombia.

Asia and China will see substantial activity with the Petronas Phase III Peninsular Gas Project underway. China has major lines planned from the Yacheng field to Hong Kong and Hainan. Thailand and Indonesia's Pertamina have substantial pipeline work scheduled.

Iran has a major program for new oil and gas lines while Kuwait is rebuilding its entire pipeline network. Spain and Portugal have major projects as does Greece and Thailand.

The North Sea has some new major pipelines planned as has Australia, South Korea and Japan. The former Soviet Republics need and plan many new gas pipelines which will be constructed if and when financing becomes available.

There will also be substantial new gas distribution lines and grids constructed in many parts of the world but those figures are not included in these projections.

INTERNATIONAL PIPELINE FORECAST 1992-93

	Mileage	Est. Cost In Billions
Natural Gas Pipelines	**22,835**	**26.295**
Petroleum Product Pipelines	**5,847**	**2.788**
Crude Oil Pipelines	**1,859**	**.995**
TOTALS	**32,341**	**30.068**
FUTURE PIPELINES		
Total Mileage All Pipelines	**13,781**	**10.940**

Natural Gas Transmission

Abu Dhabi National Oil Co.
Abu Dhabi
93 miles: 28 inches
Maqta to Al Ain
Cost: $50 million

Sonatrach - Algeria
328 miles: 48 inches
Hassi R Mel field to Moroccan border
Cost: $250 million

Gas del Estado - Argentina
350 miles: 18 inches
Santa Fe, Argentina to Montevideo, Uruguay
774 miles: 30 inches
Salta Province, Argentina to Rio Grande de Sul, Brazil
Cost: $300 million

Mt. Isa Mines Ltd. - Australia
500 miles: medium diameter
Cooper Basin fields to Mt. Isa
Cost: $75 million

Gas & Fuel Corp. of Victoria
Australia
80 miles: various sizes
Katnook to Portland, Victoria
Cost: $20 million
209 miles: various sizes
Melbourne, Victoria
Cost: $16 million

Magellan Petroleum Corp.
Australia
375 miles
Amadeus Darwin tie line to Gove
Cost: $150 million

Petrobangla - Bangladesh
159 miles: six, 16, 20 inches
Kailashtila field to grid in Ashuganj
Cost: $48.8 million

Distrigaz - Belgium
91 miles: 40 inches
Zeebrugge to Blaregnies
60 miles: 20 inches
Berneau to Bastogne
16 miles: 10, 16, 24 inches
Est. cost: $150 million

YPFB - Bolivia
332 miles: 24 inches
Santa Cruz to Brazilian border
Cost: $250 million

Companhia do Gas - Brazil
700 miles
Renewal of Sao Paolo gas line grid serving 212,000 homes and 900 industries
Est. cost: $75 million

Petrobas
Brazil
744 miles: 20-24 inches
Sao Borjato, Porto Allegre to Rio Grande do Sol
Cost: $300 million
Second phase cost: $400 million
1,175 miles large diameter
1,050 miles from Urucu region to Carajas, 125-mile spur to Manaus
Extensions to Belem and Sao Luis could add 700 miles
Cost: $400 million

Arco China/China National Offshore Oil Co. - China
480 miles: 30 inches
Yacheng field to Hong Kong
60 miles: 16 inches
Yacheng field to Hainan Island

Carbocol - Colombia
310 miles: 24 inches
San Cristobal, Venezuela to Bogota, Colombia
Cost: $200 million

Ecopetrol - Colombia
58 miles: 20 inches
Dibulla to Ballenas
Cost: $30 million

Promigas - Colombia
621 miles: 20-24 inches
373 miles: 20 inches
248 miles: 24 inches
Dibulla to Ballenas
Cost: $250 million

Naturgas Miat-Nord - Denmark
Gas grid system in Jutland provinces
Cost: $42 million

Dubai Natural Gas Co.
Dubai
200 miles: large diameter
Qatar's North field to Jebel Ali, Dubai
Cost: $150 million

Bapetco
Egypt
74 miles: 16 inches
55 miles: 16-inch loop
BED-2 to Aminiryah
19 miles
BED-2 to BED-3
Cost: $60 million

Gaz de France - France
44 miles: medium diameter
Salam to Lacq
Cost: $30 million

EVG - Germany
100 miles: medium diameter
Achim to Salzwedel
Cost: $50 million

Erdgasversogungsgesellschaft
Germany
200 miles
Vitzeroda to Niederhohndorf, Saxony
Cost: $150 million

Kombinat Gasaniagen - Germany
155 miles: medium diameter
Philippsthal to Sayda

Midal Gas Line - Germany
Joint venture: Wintershall OMV
398 miles: 32 inches
Emden to Ludwigshafen

Ruhrgas AG - Germany
153 miles: 48 inches
Werne to Schluchtern
49 miles: 40 inches
Lauterbach to Vitzeroda
15.5 miles: 24 inches
Vinnhorst to Ahlten
Cost: $150 million

Athens Gas Department - Greece
316 miles: 30 inches
Bulgarian border to Athens
Cost: $250 million

State Oil and Gas Trust - Hungary
200 miles: 28-32 inches
Beegdoroc to Szeged
Cost: $125 million

Gas Authority of India, Ltd. - India
900 miles: large diameter
Bombay to Bangalore
7,500 miles: large diameter
National gas grid
Cost: $3 billion

Gujarat Gas Co. Ltd. - India
330 miles: medium diameter
Gas network in Gujarat state
Cost: $150 million

Oil and Gas Commission - India
175 miles: medium diameter
East and West Godavan districts of Andhra Pradesh
Cost: $150 million
95 miles medium diameter
Southern loop: Western Offshore Integrated Development Project
Cost: $75 million

Pertamina - Indonesia
280 miles
Offshore line Kangean field in Bali to Surabaya and Gresmick in East Java
Cost: $200 million

Bord Gais - Ireland
170 miles: 24 inches
Scotland to Eire
Est. cost: $243 million

Snam and Enel
Italy
683 miles: 48 inches
Trans-Med expansion
229 miles: 48 inches
Loop line to Cape Bon
Est. cost: $7.3 billion

Agip - Libya
350 miles: large diameter
Bourri field offshore of Libya to Italy
Cost: $3 billion

Libyan government - Libya
448 miles: 30 inches
400 miles: al Brika to Khoma
48 miles: Sirte Basin
Cost: $880 million

Ministry of Energy - New Zealand
140 miles: 14-20 inches
Huntly to Marsden power stations
Cost: $70 million

Midgard Field Partners - Norway
300 miles: large diameter
Midgard field to existing Norwegian gas grid
Cost: $300 million

Norske Shell - Norway
Troll field to processing plant at Oeygarden or Bergen
Cost: $50 million

Statoil - Norway
681 miles
North Sea to Germany
96 miles
German land line (Zeepipe project)
Est. cost: $750 million

Petroleum Development Co. - Oman
68 miles: medium diameter
Lekhwair field to domestic gas grid
Cost: $30 million
Pakistan
Phase III Peninsular Gas Utilization Project
320 miles: 24 inches
Five-state area
Cost: $250 million

Portuguese government - Portugal
Maqta to Al Ain
200 miles
Lisbon to Braga near Spanish border plus distribution systems - five-year program
Cost: $300 million

Korea Gas Corp. - South Korea
825 miles: large diameter
Network connecting 20 major cities
Cost: $2.2 billion

Engas - Spain
300 miles: 26 inches
Seville to Madrid
Cost: $2 billion
200 miles: 12-24 inches
Redes Navarra area
Cost: $60 million

Stoseb - Sweden
150 miles gas grid around Stockholm
Cost: $30 million

Al-Furat Petroleum - Syria
335 miles: eight-18 inches
275 miles: 18 inches
Omar field to Damascus
60 miles: eight-12 inches
Omar field to Thayyem, Thisreen, Adra
Cost: $150 million

Petroleum Authority
Thailand
106 miles: 30, 32 inches
Erawan offshore field to onshore terminal at Surat Thani
208 miles: 24 inches
Erawan field to shore terminal
Est. cost: $200 million

Tunisia
149 miles
Construction of gas line from M'Saken to Gabes and construction of gas grid
Est. cost: $75 million

Botas - Turkey
400 miles up to 12 inches
Bursa city distribution system
510 miles: large diameter
310 miles from Bursa to Izmir and 210 miles from Izmir-Karabuk
Cost: $225 million

Amoco Exploration Co.
United Kingdom
254 miles: 36 inches
Central Area Transmission system: Everest and Lomon offshore field to Teesside
Cost: $225 million

Kinetica Ltd. (Conoco PowerGen)
United Kingdom
180 miles: 30-36 inches
Lincolnshire coast to power stations
Cost: $30 million

Scottish Area Gas Evacuation System (SAGE) - United Kingdom
150 miles: 24 inches
Mobil North Sea-Marathon Oil: Beryl North Sea field to St. Fergus
Cost: $75 million

Shell U.K. Exploration and Production - United Kingdom
118 miles: 24 inches
Bacton to Shell Haven refinery on the Thames Estuary
Cost: $75 million

Total Oil Marine - United Kingdom
110 miles: 22 inches
Caister field, U.K. North Sea, to Killingholme
Cost: $75 million

Corpoven - Venezuela
115 miles loop line
Anaco to Puerto la Cruz
209 miles
Anaco to Porto Ordaz
Est. cost: $100 million
Foreign Gas Distribution

Gas & Fuel Corp. of Victoria
Australia
Distribution
145 miles: various inches
Various locations in Victoria
Cost: $15 million

Ver. Energiebedrijven Scheldeland (EBES) - Belgium
132 miles: various inches
Cost: $11 million

Pertamina
Indonesia
270 miles: various inches
Offshore Kangea to Bali, Surbaya and Gresnik
Cost: $120 million

Korea Gas Co
South Korea
857 miles: various inches
Various locations in South Korea
Cost: $200 million

Crude Oil Lines

Broome Oil Pipeline Systems
Australia
300 miles: medium diameter
Canning basin area of Western Australia
Cost: $85 million

Conoc
Commonwealth of Independent States
400 miles
Tengiz field in Siberia to Caspain Sea
Est. cost: $200 million

Maxus Energy Co. (Dallas)
Ecuador
120 miles
Lago Agrio to Shushufindi, Ecuador
80 miles diesel line to supply turbine generators
Cost: $40 million

Chemopetrol Pipeline Ltd.
Germany
210 miles: 20 inches
Ingolstadt, Germany to Kralupy and Vlaton, Czechoslovakia
Cost: $50 million

National Iranian Oil Co. - Iran
600 miles: large diameter
Gach Sarn field near Persian Gulf to Port of Jask, Gulf of Oman
Cost: $500 million

New Guinea government
New Guinea
106 miles: 20 inches
Kutubo and Hedina oil fields to marine terminal at Cape Blackwood
Est. cost: $60 million

Shell Pipeline Petroleum Development - Nigeria
43 miles: 20-24 inches
Opukushi to Forcados terminal
Cost: $50 million

Product Pipelines

Petrobas - Brazil
252 miles: eight, 10 inches
Temadre to Itazuna
162 miles: eight, 10 inches
Reporto to Florianopolis
578 miles: 12-20 inches
Replan to Brasilia
Cost: $400 million

SPMR - France
93 miles: 42 inches
La Mede to Buget
Est. cost: $100 million

National Iranian Oil Co. - Iran
1,139 miles: 12 inches
Arak to Malayer and Mamadan
Est. cost: $400 million

Indian Oil Corp. - India
800 miles: 22 inches
Kandla to Karmal
132 miles: 14 inches
Karmal to Bhatinda
72 miles: 10, 14 inches
Bhatinda to Kot-Jodhpur
Est. cost: $250 million

Laos government Laos
260 miles: medium diameter
Vinh Vietnam to Vientiane, Laos
Cost: $85 million

Nigerian National Petroleum Co.
Nigeria
1,200 miles
Port Harcourt to Benin, Auchi to Kaduna
Cost: $583 million

Statoil
Norway
140 miles: 20 inches
Condensate line from Sleipner field to Karstoe
Cost: $420 million

Bela Group
Switzerland
180 miles
Wilhelmshaven refinery to Dresden, Germany
Est. cost: 280 million

Thai Petroleum Pipeline Co.
Thailand
145 miles: main and lateral lines
Sriracha refineries to north and east Bangkok terminals
Est. cost: $200 million

British Petroleum
United Kingdom
150 miles: 24 inches
Bruce field to Forties field, U.K. North Sea
Cost: $100 million

Future projects

Maghreb-Europe Gas Line
Algeria, Spain
Joint venture between Sonatrach (Algeria) and Engas (Spain)
760 miles of gas line to supply Spain and Europe
Est. cost: $1.5 billion
Completion: 1995

Department of Resources and Energy - Australia
3,000 miles: large diameter gas line
Transcontinental Australia gas system
Est. cost: $3 billion

TransAsian Consortium
Brunei, Indonesia, Malaysia, Philippines, Thailand
5,000 miles: large diameter
Fields offshore Thailand through Malaysia, Indonesia and Brunei to the Philippines
Cost: $3 billion

Gasnatural - Chile
Shell Chile and local gas distributors plan gas line from Argentina
Est. cost: $1.375 billion

Colombian government - Colombia
Plans nationwide gas grid to be fed by pipeline from Venezuela
Est. cost: $1.375 billion

Commonwealth of Independent States
Commonwealth of Independent States
1,075 miles: large diameter
375 miles from Stokmanovskoye field in Barents Sea to Murmansk
650 miles from Murmansk to St. Petersburg
Cost: $3 billion

Egypt General Petroleum Corp.
Egypt
Trans-Gulf gas line from October and Belayan fields to Ras Shukair
Est. cost: $75 million

Petroleum Exploration Co. (Japex)
Japan
150 miles from two western Japanese fields to Tokuku Electric Co. on Pacific Coast
Est. cost: $50 million

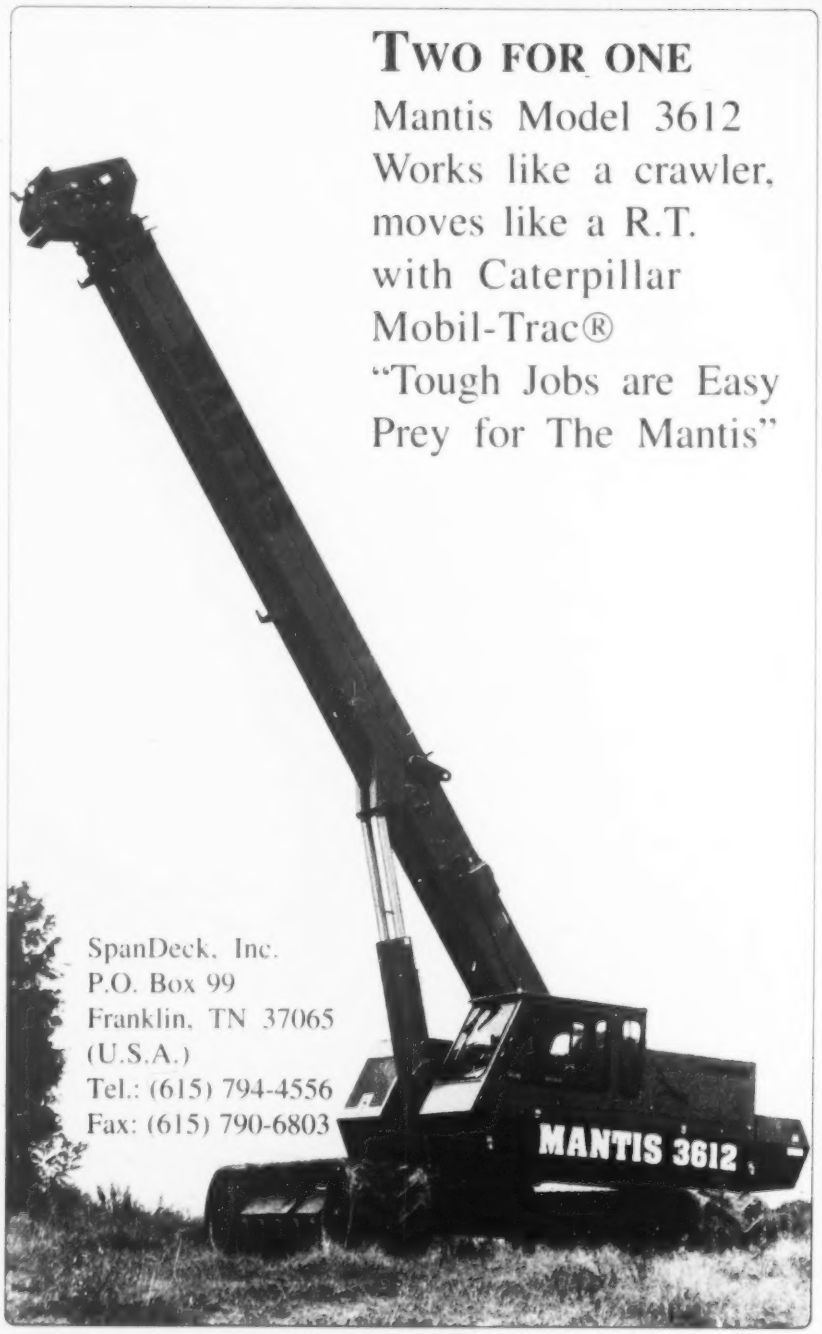
Trans Mexico - Mexico
1,315 miles: 30 inches
Line following Mexico-U.S. border
Cost: $1 billion

Petroleos del Peru
Peru
364 miles: 26 inches
64 miles: eight inches
Gas lines to Camisea to Cuzco to Callao-Lima
52 miles
Gas and product line from Aguaytia to Pucallpa-Campo Verde
Est. cost: $250 million

General Petroleum Corp. - Qatar
994 miles
Gas line from Qatar to United Arab Emirates and Iran
Est. cost: $3 billion

Trinidad and Tobago
Trinidad and Tobago
800 miles: large diameter
Trinidad and Tobago to Puerto Rico and other Caribbean islands
Cost: $2.5 billion

Yugoslavian government
Yugoslavia
650 miles: small to medium diameter
160 miles main line
415 miles main and distribution lines
75 miles urban mains
Cost: $100 million



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